

DRAWING CHANGES

Examiner has objected to the drawings for not showing every feature of the invention specified in the claims under 37 CFR 1.83(a). Applicant submits corrected drawings in compliance with 37 CFR 1.121(d). Figures 1 and 2 have been identified as prior art. Applicants have also reordered the drawings so that Fig. 2 is below Fig. 1 instead of Fig. 7.

An Annotated set and Replacement set (due to the reordering of the drawings) are provided herewith.

REMARKS

This Application has been carefully reviewed in light of the Office Action mailed March 29, 2005. At the time of the Office Action, Claims 1-21 were pending in this Application. Claims 13-21 were allowed. Claims 1, 3, 5-7, 9, 11 and 12 were rejected, and Claims 2, 4, 8 and 10 were objected to. No amendments have been made in this response. Applicants respectfully request reconsideration and favorable action in this case.

Objections under 37 CFR 1.83(a)

The Examiner has objected to the drawings for not showing every feature of the invention specified in the claims under 37 CFR 1.83(a). Applicant submits corrected drawings in compliance with 37 CFR 1.121(d). Figures 1 and 2 have been identified as prior art.

Rejections under 35 U.S.C. § 102

Claims 1, 3, 5, 6, 7, 9, 11, and 12 were rejected by the Examiner under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5, 588,028 issued to Vladimir Parizhsky ("Parizhsky"). Applicants respectfully traverse and submit the cited art does not teach all of the elements of the claimed embodiment of the invention.

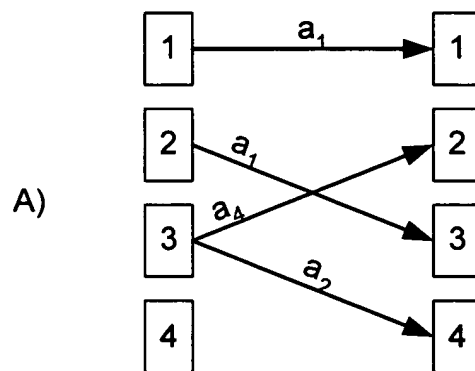
A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1997). Furthermore, "the identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Applicant respectfully submits that the cited art as anticipatory by the Examiner cannot anticipate the rejected Claims, because the cited art does not show all the elements of the present Claims.

Parizhsky discloses a simplified decoding method using less calculations than a traditional Viterbi algorithm. However, Parizhsky method uses a completely different approach than the method claimed in independent claims 1, 5, and 11. Column 3, lines 4-20 of Parizhsky explain this simplified decoding. According to Parizhsky, the simplification uses a three step process. First all permissible transitions of the decoder for a first element in a sequence are identified. See Col. 3, lines 7-10. Then, only permissible transitions which originate from the previously identified states are identified. See Col. 3, lines 11-13. Finally, the path with the lowest path metric value is selected.

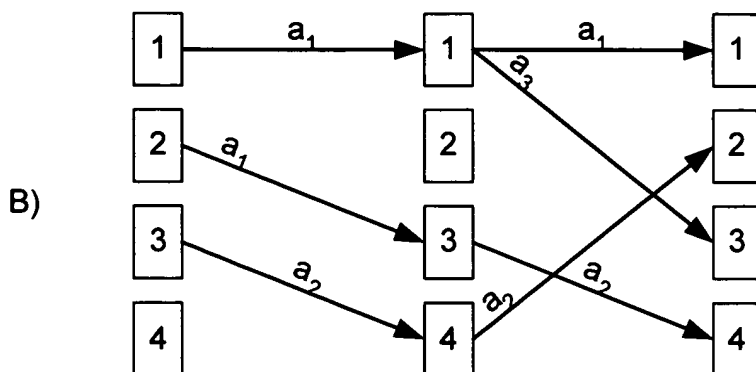
According to the present independent claims a different approach is used. First, only a preliminary decision is made with respect to a previous symbol within a symbol sequence. This can, for example, be done by selecting a symbol with the highest path metric as shown in Fig. 3A of the present application. Here the second symbol a_{k-1} within a 3 symbol sequence a_{k-2}, a_{k-1}, a_k is selected and the highest path metric is found in State 2 indicating that symbol $a_{k-1} = "1"$. In the next step, a subset of destination states is identified and excluded from calculation whereas the path metrics to the remaining states are calculated. This step is shown in Fig. 3B. Because a preliminary decision with respect to the value of $a_{k-1} = "1"$ has been made, only the path metrics originating from States where $a_{k-1} = "1"$ are calculated. Now in a third step, the most likely survivor path is determined, for example, by selecting the transition path with the highest path metric. This most likely survivor path now identifies the oldest symbol in the sequence. This step is indicated in Fig. 3B with numeral 400 indicating that the value for the first symbol $a_{k-2} = "-1"$. Now in the final step, the actual trellis is calculated by calculating only transition paths that originate from the first determined symbol a_{k-2} , as shown in Fig. 3C. Figs. 5A-5C show another example of this method using a sub-set of two consecutive symbols in a symbol sequence for the first preliminary determination.

The method according to Parizhsky uses a completely different approach. First, Parizhsky uses the term "symbol" sometimes in a different way than the present application. Parizhsky defines a symbol by a pair of coordinates in an Euclidean signal space. The method is explained in an example in col. 6, line 55 to col. 8 line 10. For the convenience of the Examiner,

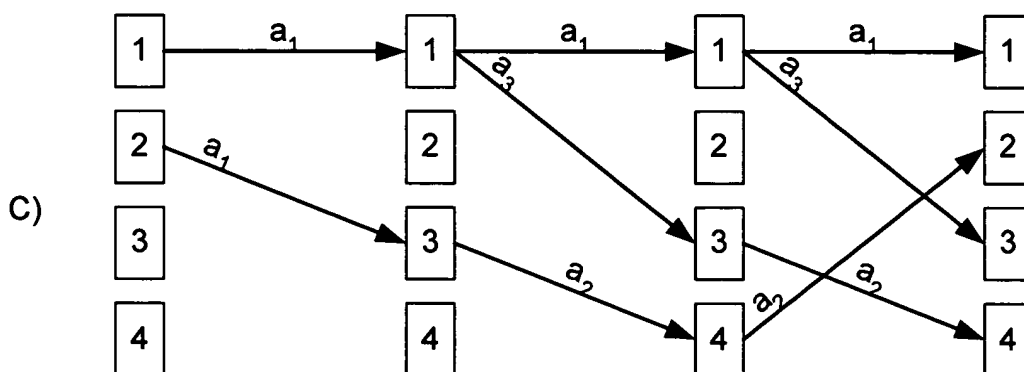
Applicants provide a visual representation of the different steps and their results according to Parizhsky. In this example Parizhsky analyzes an input sequence a_1, e, a_2 in which e is an undetermined element of the sequence. In a first step Parizhsky analyzes all possible distances in step V1. See Col. 6, lines 62-66. Then, in steps V2-V4 only half of the transition paths are kept and the rest is discarded. The result is shown below in Fig. A). Thus, contrary to the independent claims, no preliminary decision to a symbol is made because three states within the trellis are actually selected..



In the second pass, the second element is analyzed in a similar way. However, the elimination step now includes the previous trellis as shown in Fig. A) Again, all distances are calculated and then the resulting distances through the two-step trellis are used and the shortest distances determine the transitions that are kept. Thus, in this example, the transition from state 3 to state 2 in Fig. A is eliminated. The result is shown in Fig. B).



The last pass repeats these steps for the last symbol. The elimination process affects the previous two trellis by eliminating the transitions from state 3 to state 4 to state 2 in Fig. B). The resulting three-way trellis is shown in Fig. C) below:



The shortest distance through this three-way trellis is then selected to be the actual sequence received. In this case the state sequence is 2-3-4-2 representing "symbols" $a_1.a_2.a_2$.

The method according to the independent claims 1, 5, and 11 works, thus completely different. Parizhsky always must calculate all distances and then only uses a sub-set of the calculated distances by selecting the shortest paths. On the contrary, the method according to the independent claims 1, 5, and 11 preliminary works completely different as explained above with reference to the specific claim language used in this application.

Allowable Subject Matter

Applicants appreciate Examiner's full allowance of Claims 13-21 and indication that Claims 2, 4, 8 and 10 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. However, as explained above, Applicants believe that all claims are allowable over the prior art.

CONCLUSION

Applicants have now made an earnest effort to place this case in condition for allowance in light of the amendments and remarks set forth above. Applicants respectfully request reconsideration of the claims as amended.

Applicants believe there are no fees due at this time, however, the Commissioner is hereby authorized to charge any fees necessary or credit any overpayment to Deposit Account No. 19-2179.

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ANNOTATED SET

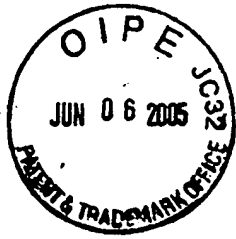


FIG. 1
(PRIOR ART)

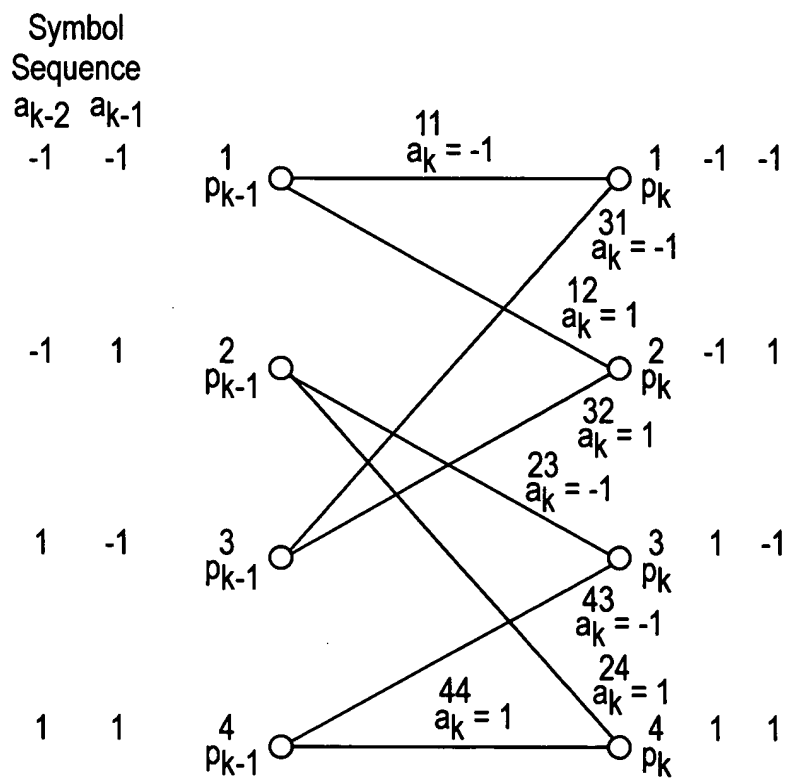


FIG. 2
(PRIOR ART)